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NOTES ON THE FLORA OF THE BERMUDAS.

BY STEWARDSON BROWN.

The present flora of the Bermudas, aside from the plants known to have been introduced through the agency of man, probably numbers about two hundred species, of which thirteen vascular forms are endemic, and has undoubtedly been derived through the usual agencies producing insular floras. On the stretches of sandy beach the same species are met with as characterize similar locations in the West Indies or Florida: *Ipomœa pes-capræ* (L.) Sweet, *Canavalia obtusifolia* (L.) D. C., *Sesuvium portulacastrum* L., *Croton punctatus* Jacq., *Scævola Plumieri* (L.) Vahl. and *Cakile lanceolata* (Willd.) O. E. Schultz, while on the rocky shores are *Borrchia arborescens* (L.) DC., *B. frutescens* (L.) DC., *Chamæsyce buxifolia* (Lam.) Small, and the two characteristic shrubs *Suriana maritima* L. and *Tournefortia gnaphalodes* (L.) R. Br. On the shores of the quiet bays and lagoons the mangrove *Rhizophora mangle* L. and *Avicennia nitida* Jacq. are the dominant species, while in the marshes *Osmunda spectabilis* Willd., *O. cinnamomea* L., *Pteridium caudatum* (L.) Maxon, *Cladium jamaicense* Crantz, *Eleocharis interstincta* (Vahl.) R. and S., *Kyllinga brevifolia* Rottb., *Typha angustifolia* L., *Myrica cerifera* L. and *Baccharis glomerulifolia* Pers. are more or less generally distributed. The plants of the higher ground seem more restricted in their distribution for the most part. *Dodonœa angustifolia* Sw. is generally distributed through the hills, *Randia aculeata* L. is known only on the Paget Sand Hills, while the following are found almost exclusively in the Walsingham Tract: *Adelia segregata* (Jacq.) Kuntze, *Psychotria undata* Jacq., *Trema Lamarkiana* (R. and S.) Blume, *Eugenia monticola* D. C. and *Zanthoxylum flavum* Vahl., the last known only from two trees, one on a hill east of Paynter's Vale (B. and B., No. 357, 1905), with several young ones surrounding it, and the other discovered by the writer in one of the sinkholes near the caves at Walsingham. These, so far as known, are all that survive of the "yellow-wood" of the islands, referred to by early writers as growing in such abundance.

With the exception of the cedar (*Juniperus bermudiana* L.), which is very abundant in the islands, by far the commonest plants to-day are those introduced by man. A number of weeds on the roadsides

and in the "gardens" and others which do not belong to this class, but have been introduced for their beauty or utility and are now so thoroughly naturalized as to have become an integral part of the flora. Among these plants the most abundant is the common sage, *Lantana involucrata* L., said to have been introduced from the Bahamas more than a century ago as a fuel, to take the place of the cedar which was being extensively used for lime burning. It is now so general throughout the islands that were it not known to be an introduction it might easily be mistaken for a native plant. *Lantana camara* L., introduced as a garden flower from Madeira in 1819, is as generally distributed though not quite as abundant, and when in flower is one of the striking plants of the roads and hillsides. The fiddlewood, *Citharexylon quadrangulare* Jacq., introduced at Paynter's Vale in 1830 by Archdeacon Spencer, is now abundant everywhere on the main island, having spread from the original tree, which is still standing. Another of Archdeacon Spencer's introductions at Paynter's Vale in 1840 was the myrtle, *Jasminum simplicifolium* Forst., which now festoons the trees and rocks, forming almost impenetrable tangles throughout the Walsingham Tract, where it has become a great nuisance by smothering many of the more desirable plants, especially the cedar. Without doubt the birds have played an important part in the spread of these four species through the islands, as all bear a profusion of berries. Other introductions are prominent features in the vegetation of the islands, but two of the most striking which are integral parts of the flora are the oleander, *Nerium oleander* L., introduced in 1790 as a rare exotic and now planted extensively for hedges and windbreaks, which is naturalized on the hillsides, and while in flower during the summer months is a gorgeous display of color, and the Life Plant of the Bermudians, *Bryophyllum pinna-tum* (Lam.) S. Kurz, introduced as a curiosity in 1813 and now abundant everywhere on the roadsides and in the woods, when flowering during the winter months, is hardly less a feature than the oleander.

In 1905, the writer, in company with Dr. and Mrs. Nathaniel Lord Britton, of the New York Botanical Garden, visited the islands between August 31 and September 20, when a collection of more than four hundred species was made, principally in the several marshes and in the Walsingham Tract. The writer made two subsequent visits to the islands,¹ from February 10 to March 9, 1908, and May 22 to June

¹ Investigation prosecuted with the aid of a grant from the Esther Herrman Fund of the New York Academy of Sciences.

2, 1909, when collections of more than three hundred species were made, a majority of which were not included in the former gatherings.

In the present paper, which is based on the observations and collections made during these several visits, only the endemic species among the flowering plants are considered, together with such as have been added to the hitherto published lists.

***Juniperus bermudiana* L.**

B. and B., No. 1, September, 1905. Mt. Langdon, north shore.

The most abundant tree, growing everywhere throughout the islands, in dry and rocky ground as well as in the marshes. At the time of flowering during March and early April the staminate trees are a golden color, presenting a striking contrast with the rich blue-green of the pistillate trees.

***Thalassia testudinum* Koenig & Sims.**

B. and B., No. 185, September, 1905. Spanish Point and Hungry Bay. Found abundantly in all the shallow bays, and is probably the basis for the record of *Zostera marina* L. of the lists, as that species was nowhere observed.

***Andropogon virginicus* L.**

B. and B., No. 225, September, 1905. Paget Marsh. Not observed elsewhere.

***Syntherisma violascens* (Link) Nash.**

B. and B., No. 57, September, 1905. Hills north of Hamilton.

***Polypogon littoralis* L.**

B. and B., No. 301, September, 1905. Roadside near Warwick Marsh, S. B., No. 698, 1909. Middle Road. Frequent on the roadsides throughout the islands.

***Eragrostis major* Host.**

B. and B., No. 308, September, 1905. In cultivated ground near Warwick Pond.

***Poa pratensis* L.**

S. B., No. 670, May, 1909. On top of cliffs, south shore, west of Tuckers Town. Frequent.

***Briza maxima* L.**

B. and B., No. 346, September, 1905. Field near Gibbs Hill Light. S. B., No. 679, May, 1909. Middle Road near Wesleyan Church. Observed at a number of places throughout the island, in the lawns and on the hillsides.

Bromus unioloides (Willd.) H. B. K.

S. B., No. 685, May, 1909. St. David's Island, growing abundantly in a field.

Hordeum pusillum Nutt.

S. B., No. 695, May, 1909. St. David's Island. Abundant on the roadsides and around St. David's Light.

Cyperus alternifolius L.

S. B., No. 578, March, 1908. Marsh near Tuckers Town. S. B., No. 726, June, 1909. Pembroke Marsh. Although undoubtedly an escape from cultivation, it is thoroughly naturalized and spreading in the localities noted.

Cyperus flavescent L.

B. and B., No. 334, September, 1905. Pembroke Marsh.

Cyperus filicin Vahl.

B. and B., No. 101, September, 1905. Serpentine Marsh.

Scirpus Olneyi A. Gray.

B. and B., No. 304, September, 1905. Warwick Marsh.

Eleocharis cellulosa Torrey.

B. and B., No. 305, September, 1905. Warwick Marsh.

Eleocharis pratensis Britton.

S. B., No. 723, June, 1909. Pembroke Marsh.

Carex bermudiana Hemsley.

B. and B., No. 224, September, 1905. S. B., No. 649, March, 1908. Paget Marsh. At the time of the preparation of the "Challenger" report, this interesting species was known only from a specimen in the Sloan Herbarium at the British Museum, and as no subsequent collections had been made up to that time, Prof. Hemsley expressed some doubt as to whether the species described by him was really collected in the islands. Our rediscovery of it in September, 1905, at what is likely to be the original locality in Paget Marsh, settles the correctness of Sloan's label beyond a doubt. The species appears restricted at the present time to this one locality, where, however, it is growing in some abundance.

Carex albolutescent Schwein.

S. B., No. 702, May, 1909. Eastern end of Devonshire Marsh. Abundant. Not observed elsewhere.

Sabal Blackburniana Glasebrook.

B. and B., No. 217, September, 1905. Throughout the islands, but varying considerably in appearance according to situations.

On the dry exposed hillsides it is more or less dwarfed and of a yellowish color, while in moist rich ground and the marshes it is a handsome tree with rich green foliage. It is recorded as at one time an abundant tree, forming extensive groves, but it is now found for the most part only in the lawns where it has been preserved. The finest natural grove observed by us is in Paget Marsh, where hundreds of examples may be seen in varying stages of growth. Some fine specimens are also to be found in the Devonshire Marsh, probably taller than any others in the islands.

***Juncus bufonius* L.**

S. B., No. 675, May, 1909. Cultivated ground, Harrington House.
S. B., No. 725, June, 1909. Pembroke Marsh.

***Nothoscordium bivalve* (L.) Britton.**

No. 415, 1905. Mr. Nicholas Peniston, Paynter's Vale. S. B., No. 696, May, 1909. Abundant in a cultivated field near Devil's Hole.

***Sisyrinchium bermudianum* L.**

B. and B., No. 2 (fruit). Mt. Langdon, north shore. S. B., No. 661, May, 1909. Harrington House. "The Bermudiana," by which name it is known throughout the islands where it is everywhere abundant, growing in all kinds of situations. During April and May it is a striking flower of the hills, roadsides and lawns.

***Peperomia septentrionalis* n. sp.**

Plant smooth, green throughout, except the peduncles and stems which are frequently rosy when exposed to strong light. Stems rather stout, 2 to 4 dm. long, ascending at the tips; leaves alternate, blades leathery, entire, dark green and shining above, glandular punctate, oval to ovate or obovate, slightly emarginate, 4 to 6 cm. long, 9 to 11 nerved, decurrent at the base, with the petioles 1 to 3 cm. long; spikes terminal or axillary in the upper leaves, simple or several times branched, .5 to 1.5 dm. long with peduncles shorter than the leaves, rather densely flowered; nutlets oblong, slightly papillose, 1 mm. long with a straight or slightly curved beak one-third their length.

In woods usually on moist or shaded rocks, frequent throughout the island from the Causeway to Tuckers Town, among the rocks and around the caves, sinks and fissures; also in the shaded portion of Paget Marsh, growing on the damp ground and over the stones, flowering from late autumn to spring. Probably most nearly related to *P. magnoliaefolia microphylla* Dahlstedt, from which it differs in the relatively broader leaves and the less strongly papillose nutlets which are oblong instead of ovate-globose.

Type, S. B., No. 428, March, 1908. Herb. A. N. S. Philadelphia. From shores of Castle Harbor, Walsingham.

***Alternanthera maritima* St. Hil.**

S. B., No. 487, March, 1908. Long Bird Island. Abundant in a little cove on the Castle Harbor side of the island, about a quarter of a mile from the end of the Causeway.

***Phytolacca decandra* L.**

B. and B., No. 219, September, 1905. Paget Marsh.

***Alsine Baldwinii* Small.**

S. B., No. 580, March, 1908. Sand Hills, Tuckers Town. Apparently an abundant plant in this portion of the island, but not observed elsewhere.

***Sagina procumbens* L.**

S. B., No. 585, March, 1908. Top of cliffs near Tuckers Town.

***Tissa marina* (L.) Britton.**

S. B., No. 591, March, 1908. South shore near Spittle Pond. Abundant.

***Silene nocturna* L.**

S. B., No. 583, March, 1908, and No. 671, May, 1909. Top of cliffs, south shore, near Tuckers Town. Frequent.

***Silene noctiflora* L.**

S. B., No. 682, May, 1909. At western end of Causeway. This species was also observed sparingly near Harrington House, in a piece of grassy woods.

***Ranunculus acris* L.**

B. and B., No. 244. Grassy woods, south shore road, Devonshire.

***Papaver Rhoeas* L.**

S. B., No. 530, March, 1908. Cultivated ground, St. Georges, near swinging bridge.

***Diploxaxis muralis* (L.) D. C.**

S. B., No. 686, May, 1909. St. David's Island. Abundant.

***Pedicularia pentaphylla* (L.) Schr.**

B. and B., No. 70, September, 1905. Cultivated ground north shore.

***Potentilla reptans* L.**

B. and B., No. 211, September, 1905. South shore road, Devonshire.

Laurocerasus caroliniana (Mill) Roem.

B. and B., No. 220, September, 1905. Paget Marsh. A number of trees of various sizes, intermixed with the cedar and Palmetto. Not observed elsewhere.

Phaseolus lunatus L.

S. B., No. 680, May, 1909. In an open cave near Tuckers Town, growing to a height of 5 to 8 meters, over the cedars and fiddlewoods; flowers white, yellow in fading. S. B., No. 719, June, 1909. Joyce's Dock Cave. Abundant, growing over the trees and rocks; flowers purple. A *Phaseolus* from this locality, which is without doubt the same, is recorded in Lefroy's list without specific name.

Poinsettia cyathophora (Murray).

B. and B., No. 296, September, 1905. Cultivated ground, Walsingham. Abundant throughout the northern end of the Walsingham region and around Bailey's Bay. Not observed elsewhere in the islands.

Cissus sycioides L.

B. and B., No. 223. Paget Marsh, climbing over the trees.

Elæodendron Laneanum A. H. Moore.

B. and B., No. 274, September, 1905 (fruit), Walsingham, near caves. S. B., No. 453, March, 1908 (flowers). Walsingham, near caves. Frequent throughout the Walsingham Tract between Paynter's Vale and the Causeway. Most abundant in the vicinity of the caves, where it becomes a handsome tree 7 to 10 meters high. The flowers appear early in March.

Abutilon abutilon (L.) Rusby.

B. and B., No. 183, September, 1905. Cultivated ground, Spanish Point.

Malvastrum americanum (L.) Torr.

B. and B., No. 248, September, 1905. Roadside near Devil's Hole. **Sida rhombifolia** L.

B. and B., No. 272, September, 1905. Walsingham. Abundant throughout the Walsingham Tract.

Turnera ulmifolia L.

S. B., No. 546, March, 1908; No. 713, May, 1909, Walsingham; and Miss Delia Marble, No. 739, April, 1909, Knapton Hill.

Isnardia palustris L.

B. and B., No. 337, September, 1905. Pembroke Marsh. Abundant.

Hartmannia speciosa (Nutt.) Small.

S. B., No. 715, May, 1909. In a cultivated field at Tuckers Town, very abundant.

Pimpinella aniseum L.

S. B., No. 535, March, 1908. On the tops of cliffs, St. George's Island.

Diospyros virginiana L.

B. and B., No. 401, September, 1905. Naturalized on the border of Warwick Marsh and spreading by suckers.

Gomphocarpus physocarpus E. Meyer.

S. B., No. 690, May, 1909. Escaped to roadside St. David's Island.

Chiococca bermudiana n. sp.

A straggling, weak-stemmed shrub seldom more than a meter high. Leaves lustrous coriaceous 5 to 12 cm. long, 2 to 6 cm. broad, elliptic to ovate, abruptly narrowed at both ends, acute or short acuminate at the apex, cuneate at the base; flowers numerous in racemose panicles, pedicels rather stout 4 to 6 mm. long, hypanthium 1 to 1.5 mm. long during anthesis, sepals triangular shorter than the calyx tube, slightly ciliate, corolla light yellow becoming darker with age, 8 to 10 mm. long, tube funnel form, lobes ovate-lanceolate less than one-third the length of the tube, stamens at the base of the tube, filaments 1 mm. long, anthers 2 to 5 mm. long, style the length of the corolla tube; fruit subglobose pure white and lustrous, 7 to 8 mm. long, slightly broader than long, flattened.

Type, B. and B., No. 181, September, 1905, in Herb. A. N. S. Phila. Shaded hillsides, north shore near Flatts. Frequent throughout the Walsingham Tract from the Causeway to Tuckers Town and sparingly on the wooded hillsides through the central part of the island.

Differs from *C. racemosa* L., to which it is most nearly related, in the larger leaves, stouter and longer pedicels and larger berries.

Galium bermudense L.

B. and B., No. 31, September, 1905. Paget Sand Hills. Hillsides and woods throughout the islands, though nowhere abundant.

Galium aparine L.

S. B., No. 461, March, 1908. Cultivated ground. Paynter's Vale. S. B., 640, March, 1908. Somerset Island.

Urospermum pteroides (L.) Schmidt.

S. B., No. 695, May, 1909. St. David's Island. In the open ground generally distributed over the eastern end of the island.

Reichardia picroides (L.) Roth.

S. B., No. 716, May, 1909. Among the sand hills on the south shore a mile west of Tuckers Town.

Eupatorium adenophorum Spreng.

S. B., No. 541, March, 1908. Roadside in St. George's, near the docks.

Erigeron Darrellianus Hemsley.

B. and B., No. 26, September, 1905. Rocks, north shore road, S. B., No. 497, March, 1908. Roadside near Harrington House, and No. 598, March, 1908. Wooded hillside near Tuckers Town. On rocks and hillsides more or less generally distributed throughout the islands, varying from a low tufted plant a decimeter or less high to a much branched straggling shrub frequently more than a meter high, flowering during March and April and occasionally with a second flowering in the autumn.

Gnaphalium purpureum L.

S. B., No. 588, March, 1908, and No. 672, May, 1909. Top of cliffs, south shore, near Tuckers Town.

Galinsoga parviflora Cav.

S. B., No. 645, March, 1908. A weed in the Public Gardens.

Achillea millefolia L.

B. and B., No. 403, September, 1905. Grassy woods, south shore road, Devonshire; also observed in cultivated ground near Hamilton.